DOCUMENT RESUME

ED 465 172 CS 510 994

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TITLE Coordinating Reading and Writing Competencies during Early Literacy Development.
PUB DATE 2002-00-00
NOTE 26p.
PUB TYPE Reports - Research (143)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Case Studies; Developmental Stages; *Emergent Literacy; Primary Education; *Reading Processes; *Reading Writing Relationship; *Writing Processes
IDENTIFIERS Cognitive Research; Phonological Awareness

ABSTRACT

At any given time, any given child may hold different, even competing, understandings of the strategies and processes involved in reading, writing, and coordinating the two. And different children's developmental paths may differ in significant ways even though they eventually achieve common outcomes. Different developmental paths notwithstanding, a central developmental accomplishment of the common outcome of becoming "conventionally" literate is the coordination of encoding/production processes and decoding/comprehension processes that allow an individual to move fluidly and flexibly across writing and reading tasks. A study was designed to document with considerable precision just how children work through the "impasse" indexed by the "production-ahead-of-comprehension" pattern. Specifically, it mapped changes in children's overt actions and inferred cognitive processes while working on specific writing-reading tasks between the time when they could write alphabetically encoded texts but not readily read them back and the time when they could both write and read alphabetically encoded texts fluently. Microgenetic case studies (i.e., intensive, mini-longitudinal studies) were conducted with 24 children with a mean age of 6 years, 4 months. Findings suggest: (1) a unique role of knowledge about phoneme-grapheme relations during this transitional process; (2) children's intense focus on linguistic units smaller than a word at the coordination point may have served multiple functions; (3) concept of word seems to play a particularly crucial role in the coordination of writing and reading competencies; and (4) the process of coordinating writing and reading competencies is an emergent, complex, multidimensional, and dynamic process. (Contains 21 references and 4 figures.) (NKA)

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Coordinating Reading and Writing Competencies During Early Literacy Development

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One of the most exciting moments in the development and learning of young children is when they begin to read and write conventionally and fluently. While this developmental milestone seems to occur almost miraculously for many children, it remains under-researched and under-theorized. Because learning to read and learning to write partially differ in terms of relevant linguistic knowledge, cognitive strategies, motivation, and function, coordinating all of the processes involved in both is no small feat. Sometimes, children's understandings of reading strategies and processes seem to outstrip their understandings of writing strategies and processes. Sometimes the converse seems to be true. At any given time, any given child may hold different, even competing, understandings of the strategies and processes involved in reading, writing, and coordinating the two. And different children's developmental paths may differ in significant ways even though they eventually achieve common outcomes (e.g., Clay, 1998).

Different developmental paths notwithstanding, a central developmental accomplishment of the common outcome of becoming *conventionally* literate is the coordination of encoding/production processes and decoding/comprehension processes that allows one to move fluidly and flexibly across writing and reading tasks (e.g., Clay, 1991, 1998). This coordination process seems to be complex and to involve qualitative changes in children's thinking about multiple dimensions of language and literacy (e.g., McGee & Purcell-Gates, 1997). Yet most research on early literacy development has focused on a single dimension of the process such as phonemic awareness (e.g., Yopp, 1998) or phonological awareness (e.g., Adams, 1990) or orthographic knowledge (e.g., Morris, 1993) or concept of word or metalinguistic awareness (e.g., Rowe, 1994). Only a handful of studies have focused on two or more of these dimensions simultaneously. However, because each dimension has been shown to contribute significantly to the process of becoming conventionally literate, this process is obviously quite complex, multidimensional, and dynamic, a fact that future research needs to address.

I first got interested in this coordination process when I noticed children composing texts with sophisticated inventive spellings that they were not able to read—even immediately after composing

them. I referred to this surprising set of behaviors as a *production-ahead-of-comprehension* phenomenon. This phenomenon is graphically represented in Figure 1.

Insert Figure 1 about here

As the figure illustrates, this child encoded his message in complex inventive spellings; the message is relatively easy to read for any adult familiar with children's emergent writing; yet the child was almost completely unable to read the text by himself without considerable assistance. When children like this one would "tell" me what they were going to write about, they were usually very coherent and fluent. When they would write their texts, however, they often labored intensely, almost painfully, to represent each individual phoneme with a grapheme. And when the children would read the texts they had just written, they tended to exhibit one of several patterns. Sometimes they focused almost exclusively on constructing meaning and paid little attention to the actual print in front of them. Sometimes they struggled to decode the text they had labored to produce, usually sounding out some words, guessing at others, and rendering a text whose meaning was quite different from the one they had encoded. And sometimes they began decoding words (or parts of words) in their texts but quickly abandoned this strategy and "read" their text without really using the print in front of them. Within a short period of time (usually 6-8 weeks), however, these children were moving across writing and reading tasks fluidly and flexibly. They seemed to have coordinated previously uncoordinated knowledges and strategies into a smooth running functional system.

Motivated by this earlier work, the present study was designed to document with considerable precision just how children work through the *impasse* indexed by the production-ahead-of-comprehension pattern. More specifically, I designed the study to map changes in children's overt actions and inferred cognitive processes while working on specific writing-reading tasks between the time when they could write alphabetically encoded texts but not readily read them back and the time when they could both write and read alphabetically encoded texts fluently. Determined not to foreclose on the apparent complexity,

multidimensionality, and dynamism of this process, I chose to focus simultaneously on several of the key dimensions of early literacy learning typically reported in the literature. The following research questions guided my work. First, what changes in children's phonological awareness and other dimensions of orthographic knowledge occurred while they were coordinating their writing and reading competencies? Second, how did children's concept of word change during this transition? Third, how did children's metalinguistic awareness change while they were coordinating their reading and writing competencies? Finally, what relations among these variables seemed especially consequential during this transition?

Method

To answer these research questions with reasonable precision, I conducted microgenetic case studies (e.g., Vygotsky, 1962; Siegler & Crowley, 1991) of children while they were coordinating their reading and writing competencies. Microgenetic case studies are intensive, mini-longitudinal studies that involve following children very closely for relatively short periods of time, carefully documenting their actions, their talk, and what they produce while accomplishing some particular task or developmental benchmark. In this particular case, I followed children from the time they first began writing using inventive spellings but had difficulty reading their texts back until beyond the time when they both wrote and read their texts with considerable flexibility, fluidity, and stability. To do this, I spent one morning per week in several first-grade classrooms during several different school years looking for children to exhibit the production-ahead-of-comprehension pattern. I also trained the teachers in these classrooms to look for the pattern, and I enlisted them as additional observers. When a child exhibited the pattern, he or she was recruited for the study. In all, I collected data from 24 children (14 girls; 10 boys). The mean age of the children was 6 years, 4 months.

Data Collection

I worked with each child once a week for however long it took the child to coordinate his or her reading and writing competencies. During each data collection session, the child was engaged in the following tasks. He or she told me a story about a recent memorable event in his or her life; the child then wrote the story down for me; finally, he or she read the story back to me. The child also completed a

word location task based on his or her written text. Finally, the child read a favorite storybook to me. Because findings from this last task are not centrally relevant to the specific research questions addressed in this study and because of space constraints, they are not reported here. All data collection sessions were audiotaped, and audiotapes were transcribed. Children's verbal and non-verbal behaviors during all sessions were documented in extensive field notes.

Data analysis

Based on my research questions, I focused on three specific dimensions of children's composing processes and products during the time when they were coordinating their writing and reading competencies: (a) phonological awareness/orthographic knowledge, (b) concept of word, and (c) metalinguistic awareness. To document children's developing phonological awareness/orthographic knowledge, I analyzed the developmental spelling patterns in their texts. To document children's developing concept of word, I analyzed the word boundaries in their texts and their performances on the word location task. To document children's developing metalinguistic awareness, I analyzed their spontaneous talk during all data collection sessions, paying particular attention to utterances about various linguistic features (e.g., sounds, letters, words, sentence structure, sentence structure, text meaning).

Because the developmental trajectories of each individual child varied considerably, I needed to organize the data in some sensible way. As a first step in this process, I tried to determine the point when each child seemed to have achieved the transition to conventional literacy—the point when each child moved back and forth across writing and reading tasks with reasonable flexibility, fluidity, and stability. Inter-judge agreement on this task was very high (94%) and differences were readily resolved through discussion. Next, I organized the data around this coordination point. For most children, I had at least 4 weeks of data prior to the coordination point and at least 4 weeks of data beyond that time. I conducted descriptive statistical analyses of children's (a) developmental spelling patterns, (b) the presence of clear-cut word boundaries in their texts, (c) their word location performances, and (d) the metalinguistic comments embedded in children's spontaneous talk during each session. I also conducted careful interpretive analyses of the patterns revealed both within and across the findings from the descriptive statistical analyses.

Results and Discussion

Phonological Awareness/Orthographic Knowledge

Many studies and reviews have reported that phonological awareness and related orthographic knowledge are foundational dimensions of fluent reading (e.g., Adams, 1990; Blachman, 2000). Other studies have shown that phonological awareness seems to facilitate word recognition (e.g., Lundberg, Frost, & Peterson, 1988; Morris, 1993). Still others have shown that children's phonological awareness and word writing/spelling skills are highly correlated (e.g., Vernon & Ferreiro, 1999).

As an index of children's phonological awareness and orthographic knowledge, I analyzed children's developmental spelling patterns using an adapted version of Gentry's (2000) account of spelling stages. I categorized children's spellings into two broad types. The first type corresponded to Gentry's "semiphonetic" stage. With semiphonetic spellings, many but not all phonemes in words are represented alphabetically and strictly on the basis of sound. The second type was comprised of Gentry's "phonetic," "transitional," and "conventional stages." In all of these stages, all phonemes in words are represented alphabetically. With phonetic spellings, phonemes are represented strictly on the basis of sound. With transitional spellings, phonemes are represented based on sound, sight, and morphosyntactic knowledge. With conventional spellings, all words are spelled correctly. The developmental spelling patterns embodied in children's text across the duration of the study are shown in Figure 2.

Insert Figure 2 about here

Before discussing findings related to developmental spelling patterns, I would like to explain how the data are organized in the figure. The C in the center of the horizontal axis represents the point at which the children were judged to have coordinated their writing and reading competencies sufficiently to move across writing and reading tasks fluidly, flexibly, and with reasonable stability. Moving to the left or right of the C, each point represents the data from previous or subsequent sessions, respectively, by five-week intervals.

As Figure 2 shows, although there was a steady decrease in the percentages of semiphonetic inventive spellings in children's texts early on in the study, the percentages of these spellings leveled off two weeks prior to the time children were judged to have coordinated their writing and reading competencies; they decreased for two weeks beyond the coordination point and then leveled off again.

Figure 2 also shows that there was a modest but steady increase in the percentages of children's phonetic/transitional/ conventional spellings for the first few weeks of the study. This increase leveled off around the coordination point, rose again during the two sessions following integration, and then leveled off again. Also worth noting here is the fact that increases in these higher-level spellings, especially after the coordination point, were accounted for almost entirely by an increase in conventionally spelled, one- or two-syllable, high-frequency words (e.g., the, happy). This suggests that, after coordination, the children were spending less time puzzling over phonological aspects of spellings (e.g., phoneme-grapheme relations) and more time thinking about visual and morphosyntactic markers (e.g., digraphs, consonant blends, verb inflections) or words as whole visual/semantic units. This finding is important and will be discussed in greater detail when I consider children's developing concept of word.

Taken together, findings from analyses of children's spellings suggest several things. First, some "critical mass" of phonological awareness/orthographic knowledge seemed necessary for children to coordinate their writing and reading competencies (all phonemes represented alphabetically in roughly 70% of words). However, the sharp increase in the quality of orthographic representation that occurred right after the coordination point suggests that the coordination itself may have facilitated children's developing phonological awareness/orthographic knowledge as much, if not more than, the converse.

Concept of Word

Clay (1991) argued that a primary task for early literacy learners is to negotiate the relations between internalized spoken words and their graphic representations. A rich body of research during the last couple of decades has shown that having a relatively stable concept of word is central to becoming a fluent reader and writer. Morris (1993), for example, demonstrated that concept of word is a concrete visual frame for early literacy learning that allows children to attend simultaneously to spacing, beginning

consonant formation, and in-depth word analysis. A relatively stable concept of word also seems to facilitate word recognition and reading fluency (e.g., Clay, 1991; Morris, 1993; Sulzby, 1985). Finally, children's developing concept of word is often highly correlated with their spelling and writing development (e.g., Richgels, 1995; Sulzby, 1986; Vernon & Ferreiro, 1999).

Concept of word has at least two central dimensions. One dimension is more perceptual, involving knowledge of a word as a bounded unit with a certain look (and sound) among other bounded units with their own unique looks (and sounds). The other dimension is more conceptual, involving knowledge of a word as a unit of linguistic organization within a complex system involving other units of linguistic organization (e.g., phonemes, morphemes, syntax, semantics). In this research, I tried to operationalize both of these dimensions, albeit in imperfect ways. I used the presence (or absence) of clear-cut perceptual boundaries between words (e.g., spaces, dashes, column formatting) as a rough index of the perceptual dimension of children's concept of word. I used performances on a word location task as a rough index of the conceptual dimension of children's concept of word.

Because my word location task was different from word recognition tasks typically used in early literacy research, I will describe it here in some detail. Rather than requiring children to read words from graded word lists, this task required them to locate the words in the texts they had just written. After children had written and read their texts to me, I asked them to locate each word they wrote—in random order and two times each. Children were only given credit for having located a word if they were successful on both trials. In some ways, my word location task may have been less complex (and less difficult) than other tasks because the children were presumably familiar with the words they just wrote, and they could use the context clues in their searches for particular words. In other ways, my task may have been more complex (and more difficult) than other tasks because some words in children's texts embodied semi-phonetic spellings and because many words were not separated from the words around them with clear-cut boundaries.

Findings from analyses of children's texts with respect to the presence of clear-cut word boundaries and word location performances are shown in Figure 3.

Insert Figure 3 about here

As this figure illustrates, there was a steady and substantial increase in the mean number of words in the children's texts marked by clear-cut boundaries before they had coordinated their writing and reading competencies. At the coordination point, approximately 70% of their words were marked with clear-cut boundaries. After that, the rate of increase in the number of words marked with clear-cut boundaries leveled off considerably. These findings suggest that the development of an increasingly stable concept of word (at least in its perceptual manifestation) was instrumental to the children's coordination of writing and reading competencies. However, precisely what role (or how large a role) is played by the perceptual dimension of the concept of word remains unclear, but becomes more clear when we look at children's performances on the word location task.

Analyses of the word location task (see Figure 3) revealed a substantial, systematic increase in the mean number of words that children located long before they had coordinated their writing and reading competencies. In fact, most children were close to the performance ceiling at the coordination point. Among other things, these findings suggest that, perhaps even more than its perceptual dimension, a firm grasp of the conceptual dimension of concept of word plays a crucial role in coordinating writing and reading competencies. This possibility becomes increasingly plausible when we view word location performance in relation to other findings in this study. For example, although clearly related based on their parallel developmental trajectories, children's excellent word recognition performances did not seem to depend in any significant way on words having clear-cut perceptual boundaries. In the beginning of the study, for example, children located 62% of the words in their texts despite the fact that only 23% were marked with clear-cut perceptual boundaries. At the integration point, they located 92% of the words in their texts when only 66% were marked with clear-cut boundaries.

If perceptual clues played a somewhat limited role in children's word location performances, what other clues might they have used to accomplish this task? Based on their changing search behaviors across

the study, the data suggest that they were increasingly using several specific syntactic and semantic clues. Early on in the study, most children seemed to conduct random searches when asked to locate words in their texts. As they moved toward the coordination point, however, they began to conduct more systematic searches. For example, they read their texts (or sections of their texts) until they found the word they were looking for. They also began to rely more heavily on lexical and syntactic markers such as using definite articles and prepositions to search for nouns and using nouns and noun phrases to search for verbs. In addition to becoming more systematic in their word search strategies, the children also became more thorough. Early on in the study, most children stopped searching after they found a single token of a given word, even if multiple tokens of the word were present in the texts. As the study progressed, many children continued searching until they had located all tokens of each word in their texts.

Also worth noting here is the fact that, before the coordination point, children's performances on the word location task were quite a bit better than their developmental spelling patterns might predict. At the beginning of the study, for example, children located approximately 62% of the words in their texts, despite the fact that all phonemes were represented in only 50% of these words. At the coordination point, they located approximately 92% of the words in their texts even though all phonemes were represented in only 66% of these words. Thus, it does not seem that phonological awareness and orthographic knowledge played a major facilitative role in children's developing ability to locate more of the words in their texts.

Another interesting finding from these data is the fact that the largest increase in spelling development occurred just after the coordination of reading and writing competencies had been achieved. Among other things, this suggests that children's concept of word may not only have developed somewhat independently of their phonological awareness/orthographic knowledge but that having a stable concept of word may have enhanced their phonological awareness/orthographic knowledge.

Finally, even though the children in this study were quite successful on the word location task during the few weeks prior to coordinating their writing and reading competencies (between 70% and 90% success rate), they struggled (and usually failed) to read their texts back fluently during the rereading

task. This finding is probably related to the fact that word location requires less cognitive "space" and coordination of fewer cognitive strategies than reading and making sense of extended text (e.g., Ferreiro & Teberosky, 1982; Sulzby, Barnhart & Hieshima, 1989).

Taken together, these various findings offer compelling evidence to support the claim that developing a stable concept of word was particularly crucial as the children in this study worked to coordinate their reading and writing competencies. Moreover, developing a stable concept of word did not seem particularly dependent on the prior or commensurate development of phonological awareness/orthographic knowledge. In fact, the converse may be true, especially with respect to learning the medial and final sounds of words and the graphemes that represent them (e.g., Morris, 1993). Finally, the findings from the present study suggest that writing (and reading one's own writing) may be especially crucial to developing the cognitive capacity for reflecting on language and for becoming consciously aware of language as a system of relations among various linguistic units or levels of organization.

Metalinguistic Awareness

Metalinguistic awareness involves tacit or explicit understandings of the forms and functions of various dimensions of language and literacy, as well as the working relations among them. A good deal of research has shown that metalinguistic awareness plays a very important role in early literacy learning. Rowe (1994), for example, found that preschool children often engaged in self monitoring, difficulty assessment, anomaly detection, hypothesis testing, and strategy evaluation while engaged in self-selected writing tasks. Yaden, Smolkin, and Conlon (1989) reported that preschoolers engaged in considerable spontaneous metalinguistic talk about letters, words, and other text features during storybook reading. Richgels (1995) found that the more metalinguistic awareness children had about English orthographic patterns, the better they were at recognizing and learning new words. And Roberts (1992) showed that children's metalinguistic awareness seems to emerge developmentally from tacit and global understandings of text structures and meanings to more explicit and focused understandings of letters, words, sentences, and other linguistic units.

After transcribing children's spontaneous talk (both private speech and speech addressed to the researcher) while composing, reading, and locating words in their texts, I segmented all transcripts into clauses based on the work of Berman et al. (1986). Next, I analyzed all transcripts recursively and developed a coding scheme of the kinds of metalinguistic comments contained in them. Although this coding scheme contained almost a dozen codes, many of these codes could be collapsed into two general types: (a) comments that focused on linguistic units smaller than a word (letters, sounds, onsets, rimes, spelling patterns) and (b) comments that focused on linguistic units as large or larger than a word (lexicon, syntax, semantics, register genre, pragmatics). I regarded comments that focused on linguistic units smaller than a word as evidence that children were puzzling over issues primarily related to phoneme-grapheme relations. I regarded comments that focused on linguistic units as large or larger than a word as evidence that children were puzzling over issues related to word choice, sentence structure, text meaning, audience, and the like. After coding all transcripts for the relative presence of these two broad types of metalinguistic comments, I calculated the percentages of clauses containing each type of comment in relation to the total number of clauses in each transcript. These percentages are shown in Figure 4.

Insert Figure 4 about here

As this figure illustrates, very little of children's spontaneous talk focused on linguistic units smaller than a word except for right around the point when they coordinated their writing and reading competencies. Moreover, a fine-grained analysis of these types of metalinguistic comments revealed that 70% of them focused on onsets, the majority of which were uttered during the word location task. Finally, if we examine Figure 4 in relation to Figure 2, we see that one of the steepest increases in children's spelling development occurred during the weeks immediately after they integrated their writing and reading competencies despite a huge drop in their spontaneous talk about linguistic units smaller than a word.

Based on these three findings, it does seem that an increased awareness of phonological and orthographic knowledge played a significant role in the final coordination of writing and reading

competencies. However, exactly how this knowledge functioned is difficult to say. One plausible hypothesis is the obvious one, namely that children needed to develop sufficient working knowledge of both the encoding and decoding dimensions of phoneme-grapheme relations to coordinate their writing and reading competencies. However, an alternative hypothesis seems to fit somewhat better with other findings in this study. Recall, for example, children's pervasive focus on onsets, especially during the word location task. This finding suggests that children may have been using their knowledge of linguistic units smaller than a word to consolidate their concept of word. If so, sounding out and talking about onsets may have functioned much like using determiners as clues when searching for nouns in the word location task.

Now, let's look at the percentages of children's comments about linguistic units as large or larger than a word. As Figure 4 illustrates, early on in the study, the majority of children's metalinguistic comments focused on linguistic units larger than a word. However, this focus declined as children reached the coordination point, after which it increased significantly but then leveled off, remaining both modest and more or less equal to children's focus on linguistic units smaller than a word for the remainder of the study.

Also important here are the specific problems or issues that children focused on in their talk about linguistic units as large or larger than a word. Recall that, before I collapsed the coded data into the two general categories used in this analysis, I had coded children's metalinguistic comments into more fine-grained categories. Analyses of these categories revealed that 75% of children's comments about linguistic units as large or larger than a word focused either on word choice (42%) or text meaning (33%).

Taken together, the distribution patterns of children's metalinguistic comments suggest a counterintuitive but plausible relation between knowledge about linguistic units smaller than a word and knowledge about linguistic units as large or larger than a word. Because the children's metalinguistic talk during all sessions prior to the coordination point focused primarily on linguistic units as large or larger than a word but almost exclusively on linguistic units smaller than a word right around the coordination point, it seems that the consolidation of phonological and orthographic knowledge might have required the

prior establishment of a rich substrate of knowledge about higher levels of linguistic organization (e.g., lexical choice, syntax, semantics, pragmatics) and perhaps the relations among them. Though speculative, I find this suggestion particularly intriguing.

Conclusions

What preliminary conclusions may be drawn from the findings from this study about what is involved in the complex, multidimensional, and dynamic process of coordinating writing and reading competencies and achieving writing and reading fluency? First, the findings suggest a unique—but perhaps limited—role of knowledge about phoneme-grapheme relations during this transitional process. Such knowledge appeared to be most crucial only during the very short period of time when children were finalizing the coordination of their writing and reading competencies. Moreover, the solidification of their phonological and orthographic knowledge seemed to require a previously constructed substrate of knowledge about other dimensions of linguistic organization and the relations among them.

Second, the findings suggest that children's intense focus on linguistic units smaller than a word at the coordination point may have served multiple functions. For example, it may have functioned to encode or decode specific phonemes, syllables, or more complex sound units. Less obviously, though, it may have functioned to encode and/or index more global linguistic units or to facilitate children's developing concept of word. Although we typically assume that talk about sounds, letters, and the relations between them marks attempts to work out phoneme-grapheme relations, such talk may be much more multifunctional.

Related to this point, a third suggestion drawn from the findings is that concept of word seems to play a particularly crucial role in the coordination of writing and reading competencies. This suggestion was supported not only by children's performances on the word location task but also by the microgenetic trajectory of their word search behaviors and the distribution patterns of their metalinguistic commentary.

Finally, and perhaps most importantly, the findings suggest that the process of coordinating writing and reading competencies is an emergent, complex, multidimensional, and dynamic process. As this process unfolds, increased knowledge of certain dimensions of linguistic organization appears to

facilitate the development of knowledge about other dimensions. Recall, for example, that the consolidation of phonological and orthographic knowledge seemed to require the prior establishment of a solid substrate of knowledge about other levels of linguistic organization and the relations among them.

Based on the collection of findings from this study, I would like to suggest that the coordination of writing and reading competencies—one way to operationalize the idea of becoming conventionally literate—is extremely complex, multidimensional, and dynamic. It seems to involve the simultaneous (though not strictly parallel) development of phonological awareness, visual and morphosyntactic aspects of orthography, concept of word, syntax, semantics, metalinguistic awareness of many levels of linguistic organization, the relations among these dimensions, and probably a good deal more.

In addition to contributing to empirical research devoted to describing and explaining early literacy learning—especially the transition to conventional literacy—this study made some small theoretical and methodological contributions. Discovering and demonstrating how various cognitive and linguistic processes seemed to operate interdependently as children coordinated their reading and writing competencies was possible, in part, because of the holistic theoretical framework I invoked. If I had limited my focus to one or even two dimensions of this process instead of focusing on multiple dimensions simultaneously, I would have missed some of the complexity, multidimensionality, and dynamism I was able to document or infer. And if I had not conducted microgenetic case studies—following children closely and at frequent intervals—I would have sacrificed considerable precision in showing how children's various knowledges and strategies developed and were coordinated to enable them to move fluidly and flexibly across writing and reading tasks.

These contributions notwithstanding, I have just begun to describe the ways in which children's reading and writing competencies develop and are coordinated so that they may move fluidly and flexibly across writing and reading tasks with considerable stability. More research is needed to map with greater precision the many dimensions involved in this process and the constitutive relations among them. More research is also needed to determine what experiences and instructional activities might be most effective in facilitating the development and coordination of these dimensions. Particularly important here might be

research on how to optimize the timing and orchestration of instructional experiences and activities in relation to different children's unique developmental trajectories.

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Figure Captions

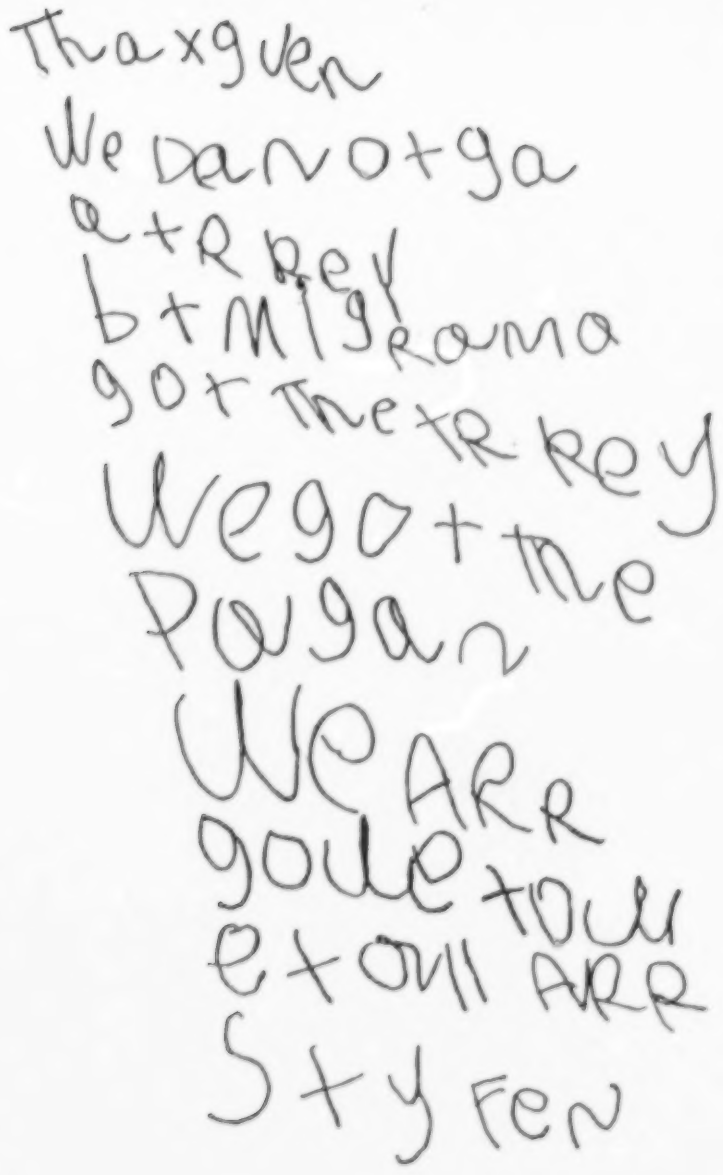
Figure 1: Exemplar of the *Production-Ahead-Of-Comprehension Pattern*

Figure 2: Mean Percentages of Semiphonetic Spellings and Phonetic/Transitional/Conventional Spellings

Figure 3: Mean Percentages of Words Marked With Clear-Cut Boundaries and Mean Percentages of Children's Word Location Performances

Figure 4: Mean Percentages of Children's Spontaneous Metalinguistic Comments

Figure 1



Child's Reading of His Story

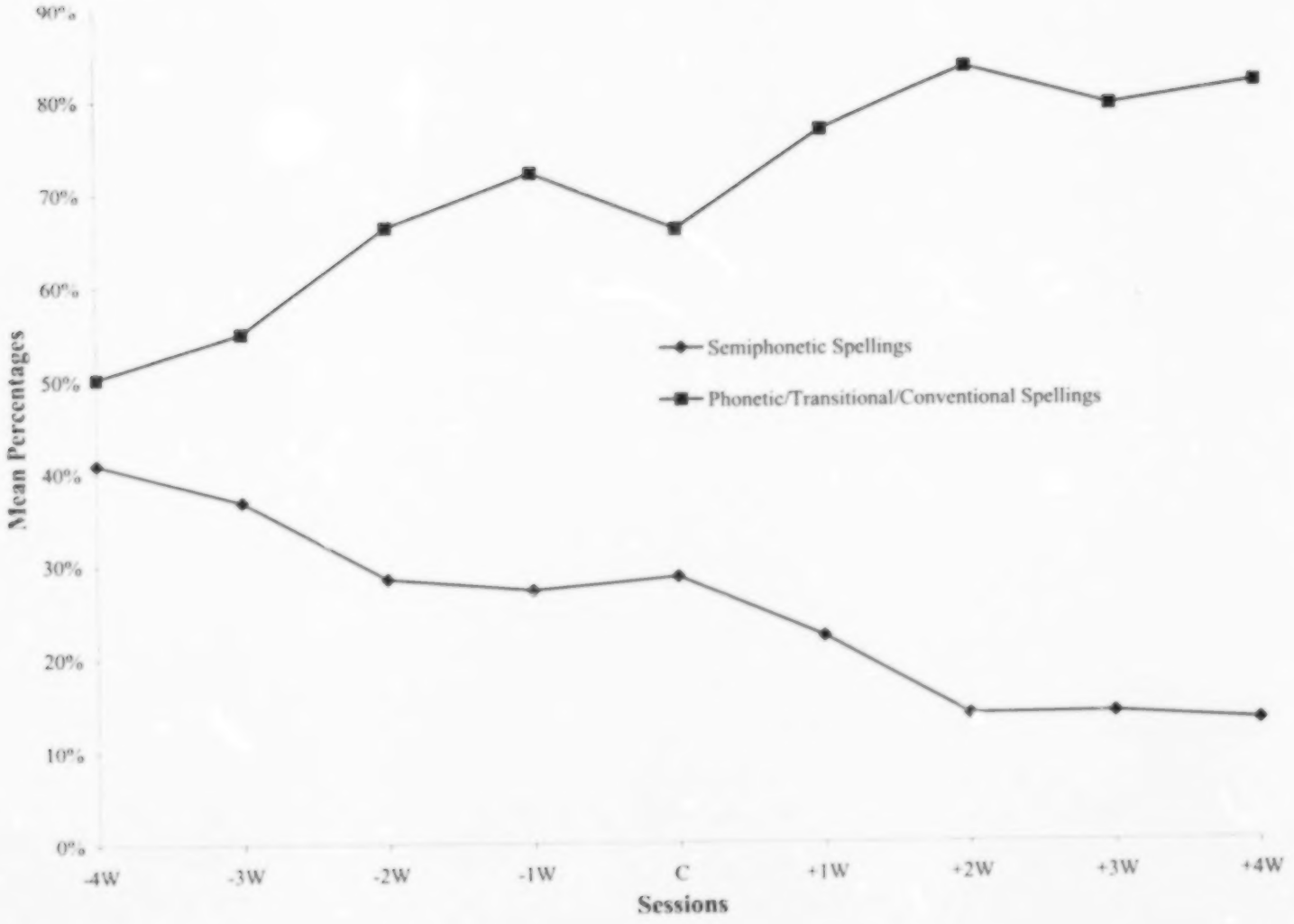
We \d\ \d\ we did \d\ \o\ we did, we went to our Grandma's. I got the, I got the third line, the second line, and the first line all wrong. We did \\ oat oatmeal. We ate oatmeal instead of turkey. Grandma had the turkey in her fridge. Our Grandma said to eat our stuffing.

Adult's Reading of the Story*

Thanksgiving. We did not get a turkey, but my grandma got the turkey. We got the pigeon. We are going to eat all our stuffing.

*Words in the adult's reading corresponded to the words that the child uttered while composing the story.

Figure 2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Mean Percentages
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Phonetic/Transitional/Conventional Spellings
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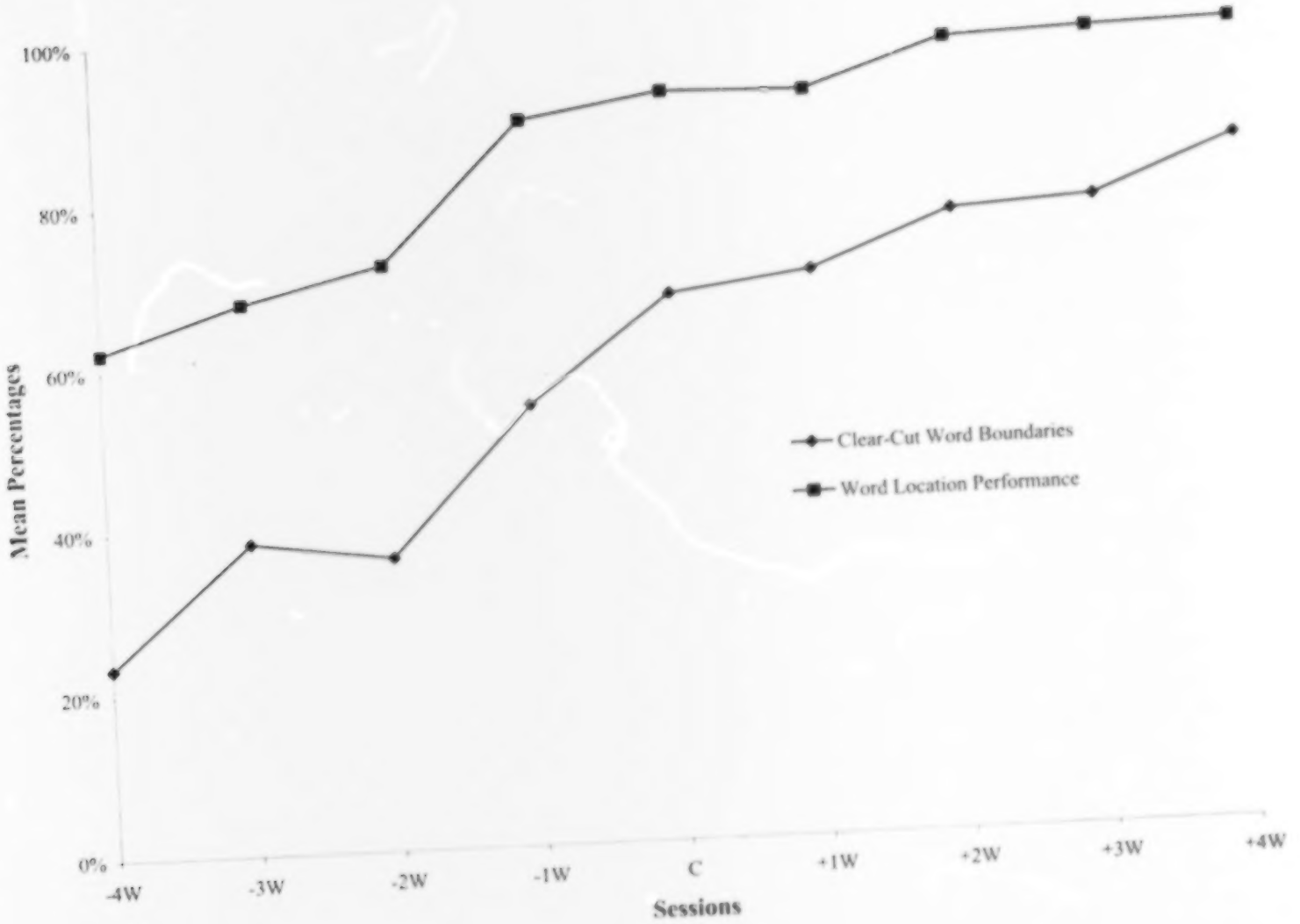
+4W
Sessions

Figure 3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Mean Percentages
Clear-Cut Word Boundaries
Word Location Performance
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-1W
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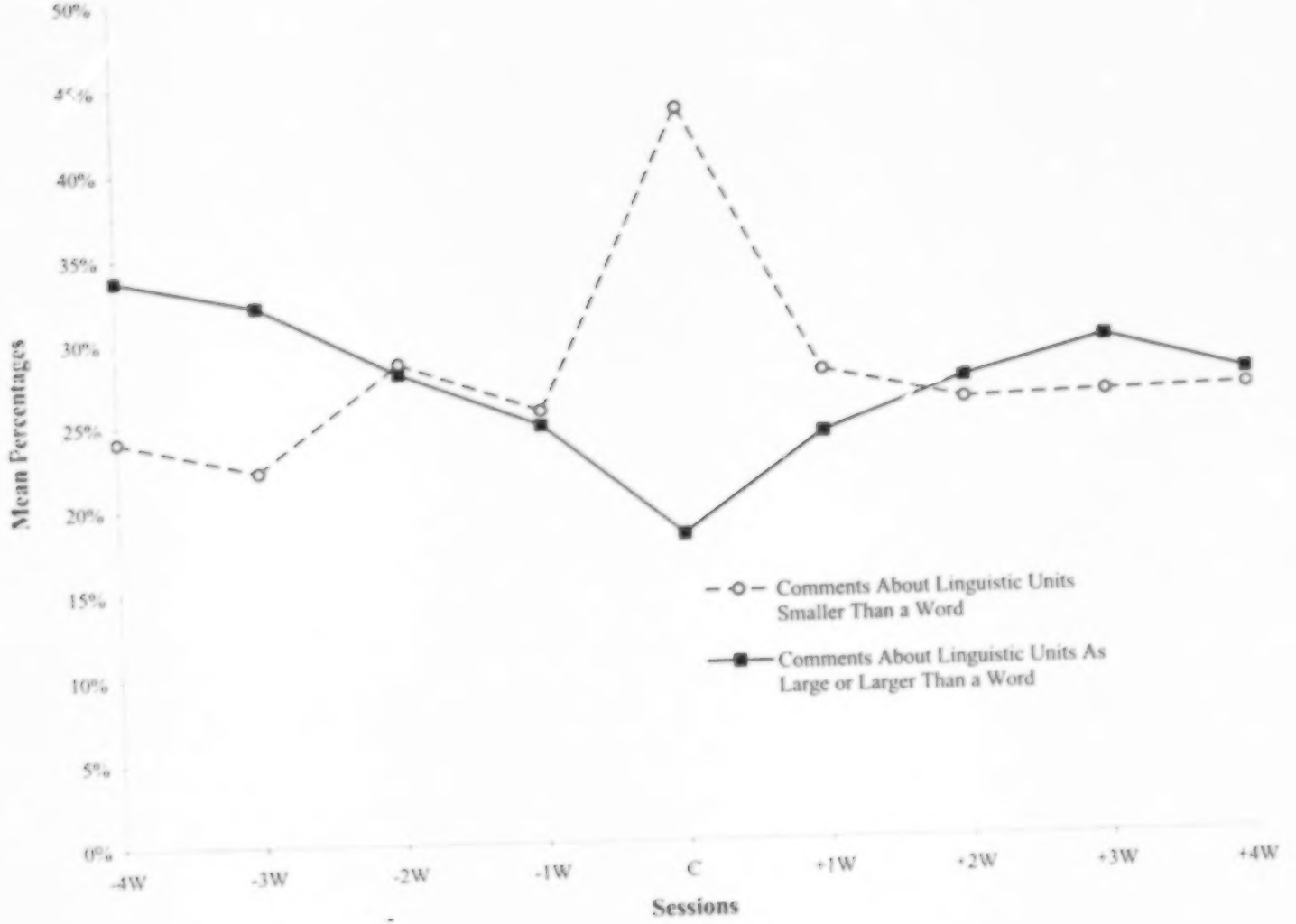
+2W
+3W
+4W
Sessions

Figure 4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Mean Percentages
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Sessions
Comments About Linguistic Units Smaller Than a Word
Comments About Linguistic Units As Large or Larger Than a Word